# Wildlife Use of Stockwatering Facilities

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Adequate water has always been and probably will continue to be a problem on grazing lands, especially in the western US. Since the earliest days of cattle grazing, ranchers have constructed various stock-watering facilities to supply the water needs of their livestock. These facilities not only should provide adequate water for livestock but also should be properly placed relative to the available forage. An adequate number of properly distributed facilities encourages uniform grazing, aids in pastures improvement practices, and retards erosion.

Through the years, wildlife has become an increasingly important range resource. While the use of existing stockwaters by wildlife has been noted by many, few of those facilities were developed for the use of both livestock and wildlife. Stock-watering facilities, by various, slight modifications, may be adapted to benefit wildlife.

### Types of Stock-watering Facilities

Stock-water supplies may be natural or constructed, permanent or temporary, and may use surface water or ground water. Primary stock-watering facilities are stock ponds, stock tanks, and dugouts. However, natural potholes may also be used by livestock.

Stock ponds are formed by building dams across natural waters (Bue et al. 1964). Located mainly in semiarid plains, stock ponds are common in the western US and Canada. These watering facilites are characterized by gently sloping shorelines except at the dam, with water levels responding to climatic factors just as natural areas do. Stock ponds support emergent and submergent vegetation, with grasses being common away from the shoreline. Many stock ponds are similar to those in eastern Montana, which have an average depth of 6.9 feet with an average surface area of 3.2 acres, and are slightly alkaline (pH 7.7–9.4).

Stock tanks are troughs or metal facilities fed by piped water from natural springs or stock ponds. Water may also be pumped from wells and piped into tanks.

Dugouts are large holes excavated to catch runoff water or to intercept groundwater. They are frequently built at the edge of a slough, pothole, or playa to collect overflow from the wet area, and they will intercept groundwater where the water table is high. Dugouts are mostly used in the prairie pothole region of the northern US and southern Canada. Dugouts have been gaining popularity since 1950 with farmers and ranchers in eastern South Dakota, and in many Soil Conservation districts, they are the only kind of stock-watering facility that has been developed. Dugouts may be constructed in intermittent waterways, on level grounds, or in temporary or semipermanent wetlands, but they are usually constructed on level ground away from wetlands. Dugouts are simple to construct and are the only type of earthen reservoirs that can be economically constructed in flat terrain. Dugouts have steep sides with one or both ends sloping gently. In South Dakota, the average size of a dugout is 60 × 160 feet with a depth of about 12 feet.

Natural potholes, depressions of glacial origin, are found on the prairies of the northern US, southern Canada, and in some intermountain glaciated valleys. Most pothole areas are on public lands used for grazing, where they provide an important source of water for livestock and wildlife.

### Effects of Livestock at Watering Facilities

Inadequate investigation and planning lead to stock-water facilities that are detrimental to proper land use. An insufficient number of unappropriately placed stock-water developments results in poorly distributed grazing patterns; overgrazing occurs near the water while distant areas are underused. In 1956, an increase in stock-water developments on the Starkey Experimental Forest and Range in Oregon resulted in decreased concentrations of cattle on overgrazed areas and increased use of areas that previously received little or no use. A decrease in trailing also resulted due to increased time that livestock spent grazing.

Livestock tend to trample shoreline vegetation, muddy the water, and contaminate it with droppings. Muddy shorelines result in greater water turbidity, which decreases the amount

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Copies of the extensive literature citations used by the authors to develop this review can be obtained upon request.

*A stock pond that offers limited uses by wildlife but has high potential for development.*

of aquatic plants and animal foods. In South Dakota, shoreline cover was influenced by grazing intensity: when grazing intensity was less than 15 cattle-days/acre-year, grass type shorelines resulted, but when grazing intensity was equal to or greater than 30 cattle-days/acre-year, mud shorelines resulted.

Overgrazing tends to eliminate habitat diversity and create a homogenous vegetative community, which results in decreased avifaunal variety. Livestock grazing may also convert native vegetation to plant species that are less palatable to the livestock themselves. In addition, livestock overuse destroys ground cover and bird nesting habitat. Livestock may also damage trees by their rubbing, browsing and trampling.

### Wildlife Use of Watering Facilities

Although it is general knowledge that many kinds of wildlife make use of stock-watering facilities, very few studies have been conducted on this subject. Waterfowl are the only wildlife species that have been studied to any extent in relation to their use of stock-watering facilities. Other wildlife are sometimes mentioned in discussions of stock-watering developments, but few studies have been conducted which observed wildlife use of stock-water in different areas. Of note is the absence of information on federally owned grazing lands, where stock-water developments should benefit both the livestock and the wildlife.

*Large Mammals*

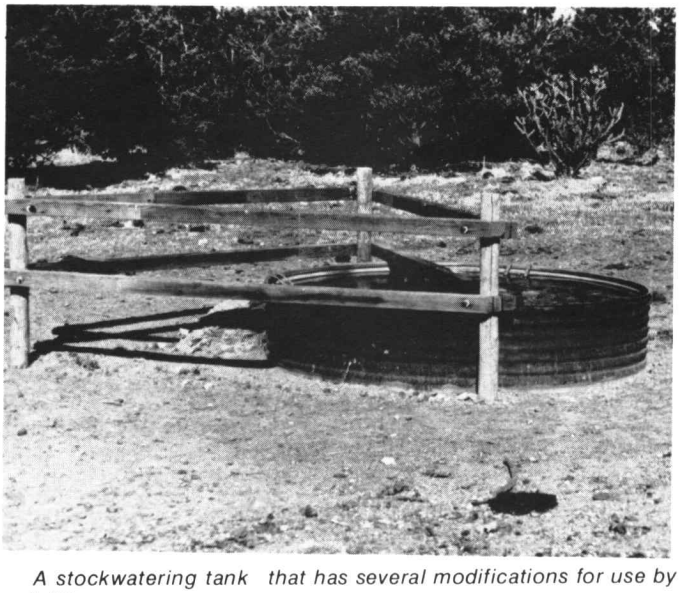
Catchment basins used by livestock are frequently used by big game in Tucson Mountain Park, Arizona; mule deer and javelina used concrete reservoirs, especially in the spring-summer dry period, and probably use stock-water wherever it is available. Deer and javelina used basins in an area near Tucson, Arizona, that was mostly closed to livestock. Bighorn sheep may use stock-water if livestock competition is not excessive. Natural pothole areas in the northern US prairies are used by summer resident pronghorn antelope, by migrating deer, and as calving grounds by elk.

*Small Mammals*

No studies were found on the use of stock water by small mammals. However, water facility modifications such as escape ramps, constructed to benefit small birds, were noted to be generally also beneficial to small mammals.

*Birds Other Than Waterfowl*

Water developments which increase the amount of available water are both beneficial and detrimental to non-game birds. Benefits include the increase in available water; the increase in insects attracted by the water, livestock, and manure; and the creation of new habitats such as dusting areas, mudflats, and marshes. Detriments include inunda-



*A stockwatering tank that has several modifications for use by wildlife.*

tion of the original habitat, attraction of predatory mammals and snakes to the water, and worst of all, livestock overuse and resulting deterioration of the area in the vicinity of the water. Additionally, troughs may be death traps for birds if escape ramps are not provided. Factors other than those mentioned may at times be detrimental to birds. For example, a rancher in Nebraska found 36 dead killdeer around the runoff from a stock tank. Fearing for the safety of his cattle, the rancher had the water analyzed. Although inconclusive, the lab analysis indicated toxic poisoning, which prompted a change in the watering system.

Upland game birds are known to use stock ponds for watering. In Tucson Mountain Park, Arizona, white-winged dove, mourning dove, and Gambel's quail used concrete reservoirs during the spring-summer dry period. However, Gambel's quail were seldom seen around reservoirs when succulents were available. Movements of Gambel's quail in southwestern Utah were affected by stock-water. During the water-critical period (June-September) they made frequent, and sometimes daily trips to water. Although some stock tanks went dry, most tanks maintained quail during the hot summer months. Potholes provide excellent habitat for marsh birds and breeding grounds for shore birds.

*Waterfowl*

Waterfowl use of stock-water facilities, especially ponds and dugouts, has been extensively studied. Breeding waterfowl require emergent and aquatic vegetation for nesting cover, escape cover, and food, which well-managed water facilities provide. It has been noted that natural potholes in Idaho provide excellent habitat for waterfowl.

Stock ponds in the northern Great Plains are used for resting by migratory waterfowl, and for breeding purposes (mostly by dabbling ducks). Over the years stock ponds in this area outproduce natural areas, because their large size and more efficient drainage retain water when natural areas go dry. In wetter years, however, marshes are better in quality than stock ponds.

The type of land use around the ponds most determines their use by waterfowl. In South Dakota, grassy shorelines, which resulted from light grazing, supported 2-3 times as many breeding pairs and were used by broods 3-4 times as much as mud shorelines, which resulted from heavy grazing. Stock ponds with no grazing however, yielded shorelines with tall emergent plants that were not suitable for dabbling ducks but may have been suitable for diving ducks. A study of waterfowl production in stock-watering ponds in relation to rest-rotation grazing in Montana showed that complete rest, or grazing only during spring and early summer, resulted in an increase in the number of duck broods the following spring, while grazing during the summer and fall resulted in a decrease of broods the following spring. Differences were attributed to regrowth of vegetation in the areas adjacent to the stock-watering facility during the summer, which left residual cover for nesting the following spring. The use of dugouts in South Dakota by waterfowl was positively correlated with vegetation height. Waterfowl use of dugouts increased as water levels increased to near ground level.

*Fish and Amphibians*

Stock ponds may also be used to produce fish and bullfrogs (Hamilton and Jepson 1940). Fresh-water fishes may be divided into cold-water and warm-water forms. Because trout, the most common cold-water fish, require water between 33 and 75° Fahrenheit with optimum temperatures being from 50 to 65° Fahrenheit, they are seldom found in stock-watering facilities. However, warm-water fish species, such as sunfish, perch, pike, catfish, and minnow families, are commonly found in stock ponds.

### Management Suggestions to Adapt Water Facilities for Wildlife

Modifications of watering facilities and management practices may be adopted to increase wildlife use. To provide the optimum benefits for wildlife, stock-water reservoirs should be protected against pollution and trampling by livestock, silting, wave action, erosion, and burrowing animals. Deferred, seasonal, or rotation grazing system should be used whenever possible, especially to increase residual vegetation. In the northern Great Plains, grazing should be delayed on areas with residual cover until incubation is finished on most nests. Additional water holes might be provided to aid in dispersal of livestock into unused areas.

Fencing provides the protection needed to develop and maintain shoreline vegetation, provides good drinking water, and establishes an environment that is beneficial to wildlife. Critical parts of the reservoir should be fenced to avoid damage by livestock, and complete fencing should be done when the range needs rest (SCS 1971). If complete fencing is required, water may be piped from the pond to a trough or tank outside the fence for use by livestock.

Riprapping the fill or planting a good vegetation cover helps prevent silting, erosion, and wave action. Additionally, special plants can be seeded which attract wildlife. Periodic maintenance checks should be made on water facilities. Burrowing animals may be stopped by using repellents or physical barriers.

Escape ramps could be constructed to prevent drowning of small birds and mammals. Log rafts or boards, anchored in the center of the pond, could be placed in the water to furnish loafing sites to increase use by breeding waterfowl. Dugouts should be built in or near natural wetland areas, where water will be at a high level in good years, and remain in some quantity during dry years. Stock ponds rather than dugouts should be constructed whenever possible, and some water areas should be developed for wildlife in areas where grazing is not allowed.

## Literature Cited

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